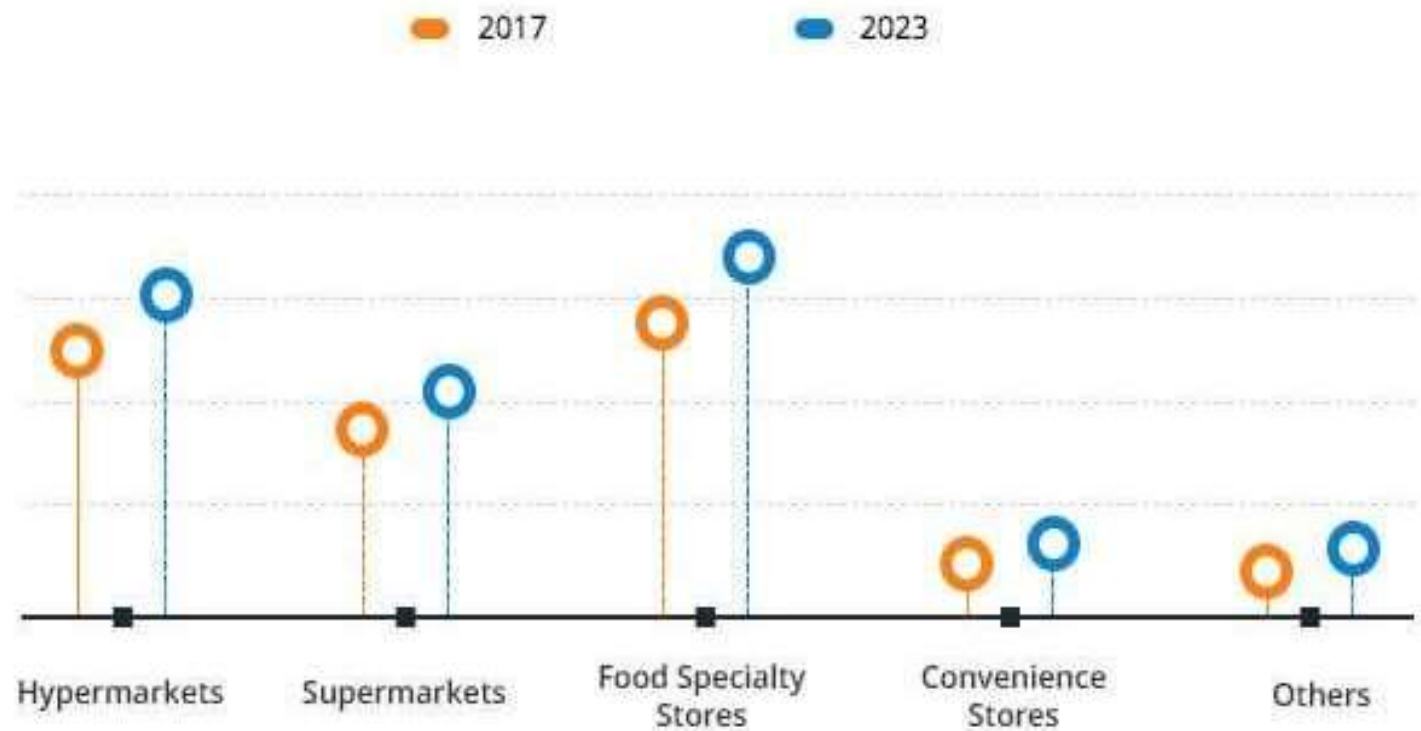




Storage and Distribution of Cheese



- ☐ After completion of post-processing treatments like bandaging and dressing, cheeses are kept in ripening room for the process of ripening.
- ☐ For Cheddar and Parmesan, ripening and storage are the same while for Camembert and Roquefort, ripening and storage are two different processes as they need altered temperature and humidity in both the processes.
- ☐ Storage is a continuation of the ripening process (except changing temperature and humidity for some varieties) so that all considerations which apply to the ripening period apply equally to the storage period.

Shelves for Ripening/Storage of Cheese

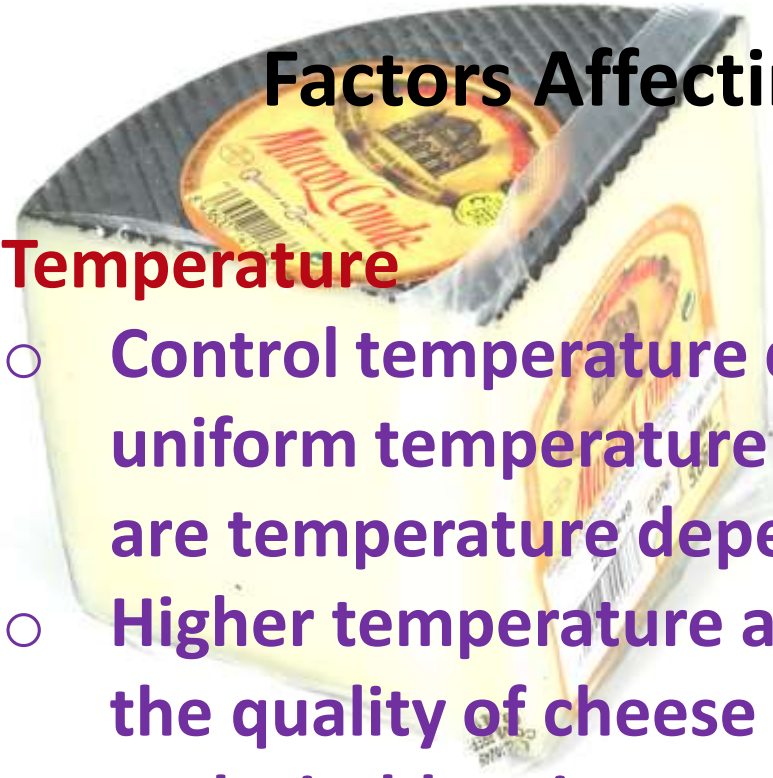
- ✓ Traditionally, wood was used as material for construction of shelves. Disadvantages: It gives shelter to pests and is an excellent medium for growth of molds and other microorganisms, once it is wet.
- ✓ Wooden shelves need lot of care and maintenance.
- ✓ Easiest materials to clean are glass and stainless steel.



Factors Affecting Ripening and Storage

Temperature

- Control temperature during storage and maintain uniform temperature as almost all biochemical reactions are temperature dependent.
- Higher temperature accelerates ripening but put at risk the quality of cheese as it results in growth of undesirable microorganisms.
- For Cheddar and related varieties, 5-7 C is ideal but 8-12 C is considered economically best.
- Temperature higher than 18 C should be strictly avoided.



Humidity

- RH of a gas is the amount of water vapour present expressed as % that required to saturate the gas.
- Higher humidity leads to mold growth, accelerated ripening and surface bacterial taints.
- Lower humidity results in cracking, shrinking, distortion and retardation of ripening in addition to excessive loss of weight.
- Correct humidity for ripening depends on type of cheese.
- Soft cheese requires higher humidity (95%) than open-textured hard cheese (85%) and these again require greater humidity than close -textured hard cheese (80%).
- Mold ripened cheese require higher humidity than other varieties of cheese.

Storage Conditions for some of Cheese Varieties

- **Cheddar, Cheshire** are ripened at lower temperatures of about 4-8 C, and RH lower than 80%. Ripening time may vary from a few months up to 8–10 months or even 12 months.
- **Emmental** are first stored in “green” cheese room at 8-12 C for 3–4 weeks followed by storage in fermenting room at 22-25 C for some 6–7 weeks. Then cheese is stored for several months in ripening store at 8-12 C with RH 85–90%.
- **Gouda, Edam** may first be stored for couple of weeks in “green” cheese room at 10-12 C and RH of 75%. Ripening period is 3–4 weeks at 12–18°C and 75–80% RH. Finally, cheese is transferred to storage room at 10–12 C and RH of 75%, where final characteristics are developed.

- **Smear-treated cheese (Tilsiter, Havarti etc.)** are stored in a fermenting room for some 2 weeks at 14–16 C and RH of 90%, during which time the surface is smeared with a special cultured smear mixed with a salt solution. Once the desired layer of smear has developed, the cheese is normally transferred to the ripening room at 10-12 C and RH of 90% for a further 2–3 weeks. Eventually, after smear is washed off and cheese is wrapped in aluminium foil, it is transferred to a cold store (6-10 C) and 70–75% RH, where it remains until distributed.



Factors Controlling the Loss of Moisture in Cheese

- Primary factors which control loss of moisture in cheese are temperature, moisture content, size and shape of cheese and RH of air.
- Rate of loss of moisture rises sharply with temperature. With storage at 5, 10 and 15 C, losses in 6 months are found to be 4.4, 6.4 and 8.7%, respectively.
- Higher the moisture content, higher will be the rate of loss and more is the free moisture. Smaller the cheese, more rapid the losses of moisture as a proportion of that initially present. Higher the RH of air in cheese storage room, slower will be rate of moisture loss.
- Other factors that influence the loss of moisture during storage are type and quality of wax or film applied to the outside of cheese and type of cheese.

Distribution of Cheese

- Distribution of cheese from manufacturer to distributor/retailer should be done under strict conditions of appropriate temperature.
- For cheese varieties, which continue to ripen in the storage period, it is important to maintain the temperature for ripening during distribution also. Eg., Cheddar cheese should be distributed at 5-8 C.
- Refrigerated and insulated vehicles are used for this purpose.

